Appendix E: List of Risk Factors

Tables 10, **11** and **12** outline falls risk factors, health conditions associated with increased risk for falls, and factors associated with an increased risk for fall injuries. This is not an exhaustive list. The key findings from the evidence are included. Categories for risk factors vary in the literature and some risk factors may fall under more than one category. Additional risk factors and conditions were added based on the expert panel; these are indicated by an asterisk (*) symbol.

Table 10: Falls Risk Factors

FALLS RISK FACTOR GROUP	RISK FACTORS
Behavioural or psychological (activity-related)	■ Hurrying; not paying attention* ■ Taking risks (e.g., climbing on a chair) ■ Physical inactivity ■ Fear of falling ■ Dual tasking (performing two tasks simultaneously) ■ Incorrect use of assistive devices ■ Wearing unsupportive footwear ■ Substance use (i.e., drugs and alcohol)*
Biological (sometimes called intrinsic)	Non-modifiable: ■ Advanced age and/or associated frailty ■ Previous falls ■ Some diseases (e.g., macular degeneration, glaucoma, dementia)* Modifiable (or amenable to interventions to reduce risk): ■ Impaired balance, gait, or mobility, including disability, amputation, muscle weakness (especially in legs), slowed reflexes (reactive power) ■ Cognitive impairments: confusion or altered mental status, delirium ■ Impaired vision ■ Incontinence ■ Malnutrition and related sarcopenia (loss of muscle mass and strength) ■ Symptoms: □ Vertigo, dizziness □ Sleep disturbance □ Postural hypotension

FALLS RISK FACTOR GROUP	RISK FACTORS
Environmental or situational (sometimes called extrinsic)	■ Polypharmacy ■ Use of certain medications (e.g., anticonvulsants, tranquilizers, antihypertensives, opioids/narcotics, anti-depressants) ■ Home hazards (e.g., loose carpets, pets, stairs) ■ Prolonged hospital stay ■ Need for transfer assistance ■ Use of restraints* ■ Side rails*
Socio-economic*	■ Unable to afford supportive footwear* ■ Unable to afford certain medications, nutritious foods* ■ No social supports; isolated* ■ Unable to read (e.g., instructions on medicine bottles)*

Sources: Ambrose et al., 2015; Ambrose et al., 2013; Boelens et al., 2013; Callis, 2016; Deandrea et al., 2013; Flaherty & Josephson, 2013; Gleeson et al., 2014; NICE, 2013; Papaioannou et al., 2015; Rice et al., 2015; Vieira et al., 2011; Wallis & Campbell, 2011; Zhao & Kim, 2015.

* Provided by the expert panel.

Note: Findings regarding gender as a risk factor for falls (i.e., whether being male or female increased the risk for falls) was inconsistent in the literature (Ambrose et al., 2015; Ambrose et al., 2013; Callis, 2016; Deandrea et al., 2013).

Various diagnoses predispose a person to falls, including health conditions that affect strength, balance, mobility, judgment, and neurological function (e.g., sensation). **Table 11** provides a list of conditions and references with information on falls risk.

Table 11: Health Conditions Associated with Increased Risk for Falls

CONDITION	REFERENCES
Cancer	Callis, 2016
Dementia/cognitive impairment	Ambrose et al., 2015; Ambrose et al., 2013; Booth et al., 2015; Bunn et al., 2014; Burton et al., 2015; Chan et al., 2015; Guo et al., 2014; Hunter, Wagg, Kerridge, Chick, & Chambers, 2011; Jensen & Padilla, 2011; Meyer et al., 2015; Vieira et al., 2011; Winter, Watt, & Peel, 2013; Zhao & Kim, 2015
Haemophilia	Flaherty & Josephson, 2013
Multiple sclerosis	Gunn et al., 2015; Sosnoff & Sung, 2015
Osteoarthritis	Mat et al., 2015
Osteoporosis	Papaioannou et al., 2015
Overall frailty, older age	Ambrose et al., 2015; Ambrose et al., 2013; Bula, Monod, Hoskovec, & Rochat, 2011; Cadore et al., 2013; Guo et al., 2014; Vieira et al., 2011; Zhao & Kim, 2015; Zia et al., 2015
Parkinson's disease	Allen et al., 2011; Bloem et al., 2016; Mansfield et al., 2015; Monti, Bellini, Medri, & Pillastrini, 2011; Shen et al., 2016
Psychiatric illness (including depression)	Bunn et al., 2014; Callis, 2016; Changqing et al., 2015
Risks for non-ambulatory adults (those who utilize a wheelchair as their primary means of mobility) **Device-related characteristics (e.g., wheelchair design), transfer activities, impaired seated balance, other environmental factors (e.g., carpeted flooring)**	Rice et al., 2015
Stroke	Verheyden et al., 2013; Vieira et al., 2011; Walsh, Horgan, Walsh, & Galvin, 2016

Table 12 provides a list of specific factors associated with an increased risk of fall injury. References are provided as available.

Table 12: Factors Associated with Increased Risk of Fall Injury

RISK CATEGORY	SPECIFIC RISK FACTORS
Bleeding risk	■ Haemophilia (Flaherty & Josephson, 2013) ■ Thrombocytopenia* ■ Anticoagulation therapy* ■ Antiplatelet therapy* ■ Liver or kidney disease (hemodialysis)*
Fracture risk	■ Renal bone disease (dialysis)* ■ Residents in long-term care (may also apply to other settings*) with: □ prior hip or spine fracture; □ history of more than one fracture (other than hands, feet, or ankles); □ recent use of systemic glucocorticoids and history of fracture; and □ osteoporosis, osteopenia (Papaioannou et al., 2015).
Skin integrity risk*	Skin tears due to fragile skin and shearing forces*

* Provided by the expert panel.